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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,870	05/11/2001	Murali Chaparala	ONX-117B	7261
27652	7590	08/24/2004	EXAMINER	
JOSHUA D. ISENBERG 204 CASTRO LANE FREMONT, CA 94539			ROJAS, OMAR R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/853,870

Applicant(s)

CHAPARALA, MURALI

Examiner

Omar Rojas

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 2-6, 11-18, 20 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 7-10, 19 and 21-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on May 11, 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0204, 0704.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The prior art documents submitted by applicant in the Information Disclosure Statement(s) filed on February 21, 2004 and July 3, 2004 have all been considered and made of record (note the attached copy of form(s) PTO-1449).

Response to Amendment

2. With regards to the amendment filed on May 27, 2004, all the requested changes to the claims have been entered. Claims 2-26 are pending.

Claim Objections

3. Claims 2 and 11 are objected to because of the following informalities: Claims 2 and 11 recite the terms "*a magnetic field*" and "*a sense magnetic field*", respectively. There is insufficient antecedent basis for these terms(s) as recited in the claims. It is also unclear whether these terms are part of the claimed invention because they are not defined by any physical structure recited by the apparatus claim(s) and are presented within a "wherein" clause. See MPEP § 2106. Appropriate correction is required.

4. In view of the previous remarks and for purposes of this examination, no patentable weight is given to the terms "*a magnetic field*" or "*a sense magnetic field*" recited by claims 2 and 11.

5. Claim 3 is objected to because of the following informalities: In claim 3, it is unclear whether the limitation "*at least one magnetic sensor*" refers to the

Art Unit: 2874

magnetic sensor disposed on the micro machined optical element as also recited by the claim or a different magnetic sensor. Appropriate correction is required.

6. Claim 5 is objected to because of the following informalities: In claim 5, the term "*at least one sensor*" as used in the claim is unclear. This is because it is not clear what sensor is being referred to. See the previous remarks concerning claim 3. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. **Claims 2-5 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by B. Eyre and K. S. J. Pister, Micromechanical Resonant Magnetic Sensor in Standard CMOS, Transducers 97, 1997 Int. Conf. Solid-State Sensors and Actuators, Chicago, Jun. 16-19, 1997 (also cited in U.S. Patent No. 6,214,318), hereinafter "Eyre".**

Art Unit: 2874

Regarding claim 2, Eyre discloses an apparatus, comprising: a) a micro machined optical element (Fig. 3) and b) a magnetic sensor ("metal loop") disposed on the micro machined optical element.

Regarding claim 3, the micro machined optical element includes a moveable portion ("oxide plate"); and at least one magnetic sensor ("metal loop") disposed on the moveable portion.

Regarding claim 4, the magnetic sensor ("metal loop") includes a sensor selected from the group consisting of, magneto resistive sensors, giant magnetoresistance sensors, colossal magnetoresistance sensors, anisotropic magnetoresistance sensors, magnetic tunnel junction devices, Hall effect sensors, flux sensing coils, magnetostriction sensors and magneto optic sensors.

Regarding claim 5, the micro machined optical element includes a fixed portion to which the support beam is connected (as seen in Figures 3 and 4) and the magnetic sensor ("metal loop") is located on the fixed portion as seen in Figure 4.

Regarding claim 11, see the previous remarks.

10. Claims 2-6, 11-18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,388,789 to Bernstein, provided by applicant in the IDS statement filed February 21, 2004.

Art Unit: 2874

Regarding claim 2, Bernstein discloses an apparatus (e.g., see Figures 7a-7b), comprising: a) a micro machined optical element (200), and b) a magnetic sensor ("coil pairs") disposed on the micro machined optical element. See Bernstein at column 14, lines 47-67.

Regarding claim 3, the micro machined optical element (200) includes a moveable portion (3) and at least one magnetic sensor ("coil pairs") disposed on the moveable portion.

Regarding claim 4, the magnetic sensor ("coil pairs") includes a sensor selected from the group consisting of, magneto resistive sensors, giant magnetoresistance sensors, colossal magnetoresistance sensors, anisotropic magnetoresistance sensors, magnetic tunnel junction devices, Hall effect sensors, flux sensing coils, magnetostriction sensors and magneto optic sensors.

Regarding claim 5, the micro machined optical element includes a fixed portion 202 of Fig.7A-7B and the sensor includes the magnetic sensor located on the fixed portion as shown in Fig.7A-7B.

Regarding claim 6, the magnetic sensor located on the fixed portion is disposed on a sidewall 3A of Fig.7A of the fixed portion.

Regarding claim 11, see the previous remarks concerning claims 2-3.

Art Unit: 2874

Regarding claim 12, a magnetic structure 100 of Fig. 4C disposed on the micro machined optical element creates or changes the magnitude or direction of a sense magnetic field.

Regarding claim 13, the magnetic sensor ("coil pairs") includes a sensor selected from the group consisting of, magneto resistive sensors, giant magnetoresistance sensors, colossal magnetoresistance sensors, anisotropic magnetoresistance sensors, magnetic tunnel junction devices, Hall effect sensors, flux sensing coils, magnetostriction sensors and magneto optic sensors.

Regarding claim 14, the magnetic sensor includes two or more magnetic sensors 6, 7 as seen in Fig. 4C.

Regarding claim 15, the two of more sensors are coupled together in a bridge circuit as shown in Fig.3B (column 8, lines 47-63).

Regarding claim 16, the bridge circuit is a Wheatstone bridge circuit as shown in Fig.3B.

Regarding claim 17, the micro machined optical element includes a moveable portion 3 of Fig. 5 wherein the moveable portion is moveable with respect to an axis 40.

Art Unit: 2874

Regarding claim 18, the magnetic material is disposed parallel to the axis as shown in Fig.4C.

Regarding claim 20, the magnetic material is located perpendicular to the axis as shown in Fig. 5.

11. Claims 2-5, 11-13, 17-18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,188,504 to Murakami et al. (hereinafter "Murakami").

Regarding claim 2, Murakami discloses an apparatus (e.g., see Figures 57-60), comprising: a) a micro machined optical element (1400), and b) a magnetic sensor (1426) disposed on the micro machined optical element. See also Murakami at column 55, lines 57-68.

Regarding claim 3, the micro machined optical element (1400) includes a moveable portion (1401) and at least one magnetic sensor (1426) disposed on the moveable portion.

Regarding claim 4, the magnetic sensor (1426) includes a sensor selected from the group consisting of, magneto resistive sensors, giant magnetoresistance sensors, colossal magnetoresistance sensors, anisotropic magnetoresistance

Art Unit: 2874

sensors, magnetic tunnel junction devices, Hall effect sensors, flux sensing coils, magnetostriction sensors and magneto optic sensors.

Regarding claim 5, the micro machined optical element (1400) includes a fixed portion (1403) and the sensor includes the magnetic sensor (1426) located on the fixed portion as shown in Fig. 57.

Regarding claim 11, see the previous remarks concerning claims 2-3.

Regarding claim 12, a magnetic structure (1404) disposed on the micro machined optical element creates or changes the magnitude or direction of a sense magnetic field.

Regarding claim 13, the magnetic sensor (1426) includes a sensor selected from the group consisting of, magneto resistive sensors, giant magnetoresistance sensors, colossal magnetoresistance sensors, anisotropic magnetoresistance sensors, magnetic tunnel junction devices, Hall effect sensors, flux sensing coils, magnetostriction sensors and magneto optic sensors.

Regarding claim 17, the micro machined optical element includes a moveable portion (1401) wherein the moveable portion is moveable with respect to an axis (column 55, lines 21-44).

Art Unit: 2874

Regarding claims 18 and 20, the magnetic material (1404) is disposed substantially both parallel and perpendicular to the axis (see also Figure 1).

Claim Rejections - 35 USC § 103

12. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

13. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyre as applied to claims 2-3 above, and further in view of U.S. Patent 6,633,693 to Peale et al. (hereinafter "Peale").

Regarding claims 24-26, Eyre discloses an apparatus, comprising: a) a micro machined optical element (Fig. 3) and b) a magnetic sensor ("metal loop") disposed on the micro machined optical element.

Eyre differs from claims 24-26 in that Eyre does not disclose means for measuring temperature and means for compensating for a change in the property of the magnetic sensor with temperature wherein the compensating means includes means for determining a relationship between the property of the magnetic sensor and the measured temperature and further includes means for regulating the temperature to maintain the temperature within a desired range.

Peale is a related disclosure dealing with micro-machined systems such as the

Art Unit: 2874

ones disclosed by Eyre.

As seen in his Figure 4, by way of example, Peale discloses means for measuring temperature (42) and compensating means including means for determining a relationship between the property of a micro-mirror and the measured temperature (50) and further including means for regulating the temperature (55) to maintain the temperature within a desired range.

The motivation for modifying Eyre is recognized by Peale: temperature can adversely effect the operation of micro-mirrors such as the ones disclosed by Eyre. See Peale at column 1, lines 55-67.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to combine Eyre with Peale to obtain the invention specified by claims 24-26.

14. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein as applied to claims 2-3 above, and further in view of U.S. Patent 6,633,693 to Peale et al. (hereinafter "Peale").

Regarding claims 24-26, Bernstein discloses an apparatus (e.g., see Figures 7a-7b), comprising: a) a micro machined optical element (200), and b) a magnetic sensor ("coil pairs") disposed on the micro machined optical element. See Bernstein at column 14, lines 47-67.

Art Unit: 2874

Bernstein differs from claims 24-26 in that Bernstein does not disclose means for measuring temperature and means for compensating for a change in the property of the magnetic sensor with temperature wherein the compensating means includes means for determining a relationship between the property of the magnetic sensor and the measured temperature and further includes means for regulating the temperature to maintain the temperature within a desired range.

Peale is a related disclosure dealing with micro-machined systems such as the ones disclosed by Bernstein.

As seen in his Figure 4, by way of example, Peale discloses means for measuring temperature (42) and compensating means including means for determining a relationship between the property of a micro-mirror and the measured temperature (50) and further including means for regulating the temperature (55) to maintain the temperature within a desired range.

The motivation for modifying Bernstein is recognized by Peale: temperature can adversely effect the operation of micro-mirrors such as the ones disclosed by Bernstein. See Peale at column 1, lines 55-67.

Therefore, it would have been obvious to one of ordinary skill at the time of the

Art Unit: 2874

claimed invention to combine Bernstein with Peale to obtain the invention specified by claims 24-26.

15. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami as applied to claims 2-3 above, and further in view of U.S. Patent 6,633,693 to Peale et al. (hereinafter "Peale").

Regarding claims 24-26, Murakami discloses an apparatus (e.g., see Figures 57-60), comprising: a) a micro machined optical element (1400), and b) a magnetic sensor (1426) disposed on the micro machined optical element. See Murakami at column 55, lines 57-68.

Murakami differs from claims 24-26 in that Murakami does not disclose means for measuring temperature and means for compensating for a change in the property of the magnetic sensor with temperature wherein the compensating means includes means for determining a relationship between the property of the magnetic sensor and the measured temperature and further includes means for regulating the temperature to maintain the temperature within a desired range.

Peale is a related disclosure dealing with micro-machined systems such as the ones disclosed by Murakami.

As seen in his Figure 4, by way of example, Peale discloses means for

Art Unit: 2874

measuring temperature (42) and compensating means including means for determining a relationship between the property of a micro-mirror and the measured temperature (50) and further including means for regulating the temperature to maintain the temperature within a desired range (55).

The motivation for modifying Murakami is recognized by Peale: temperature can adversely effect the operation of micro-mirrors such as the ones disclosed by Murakami. See Peale at column 1, lines 55-67.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to combine Murakami and Peale to obtain the invention specified by claims 24-26.

Allowable Subject Matter

16. Claims 7-10, 19, and 21-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter: Regarding claims 7 and 8, the aforementioned references do not disclose or suggest, alone or in combination, providing an additional magnetic sensor on a base or a top chip of a fixed portion which is separate from the moveable portion. Such features appear to be novel in view of the cited references. Regarding claims 9 and 10, the aforementioned references do not

Art Unit: 2874

disclose or suggest, alone or in combination, providing an additional magnetic sensor on a fixed portion which is separate from the moveable portion and electrically coupling the magnetic sensor on the fixed portion to the magnetic sensor on the movable portion in a bridge circuit. Such features appear to be novel in view of the cited references. Regarding claims 19 and 21-23, the aforementioned do not disclose or suggest, alone or in combination, using a magnetoresistive sensor having the recited shape(s). Such features appear to be novel in view of the cited references.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (571) 272-2357 and whose e-mail address is *omar.rojas@uspto.gov*. The examiner can normally be reached on Monday-Friday (7:00AM-3:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick, can be reached on (571) 272-2344. The official facsimile number for regular and After Final communications is (703) 872-9306. The examiner's RightFAX number is (571) 273-2357.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

Art Unit: 2874

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Omar Rojas
Patent Examiner
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or
August 16, 2004


AKM ENAYET ULLAH
PRIMARY EXAMINER